

UB Department of Computer Science and Engineering

BS in Computer Engineering (CEN)

Facts About CSE@UB

FAQ:

Full-time faculty: 38 Typical
CSE class size: 50 Average

starting salary for
undergraduate degree holders:
\$64,499

CSE degrees offered:

- BA, BS in computer science
- BS in Computer Engineering
- A five-year path to a combined BS/MS in Computer Science
- A five-year combined BA in CS + MBA
- MS, PhD in Computer Science and Engineering
- BS in Bioinformatics with CSE concentration

Research centers directed by CSE faculty:

- Buffalo Center for Biomedical Computing (BCBC)
- Center of Excellence in Document Analysis and Recognition (CEDAR)
- Center of Excellence for Information Systems, Assurance, Research, and Education (CEISARE)
- Center for Unified Biometrics and Sensors (CUBS)
- CSE department faculty are affiliated with the Center for Cognitive Sciences

Computer Engineers Design and Develop Practical Systems

Computer and information technologies are critical to the nation's technological infrastructure and competitive advantage in the knowledge-based global economy of the 21st century. These technologies have not only enabled discoveries and inventions in diverse fields of study, but have transformed society and our daily lives in dramatic ways.

Computer engineers are engaged in designing a wide range of devices, systems, software, and services. They design the control systems for automated production lines in industry, create software for digital telephone switching systems, and develop the installation of a local area network (LAN). Thus, computer engineers work in every sector of industry, government, and society in general.

Computer engineers may use their knowledge to:

- analyze users' needs, and then design, test, develop, and maintain software or specialized utility programs to meet those needs;
- create algorithms that tell the computer what to do;
- design, develop, test, and evaluate software and systems that make computers work, including computer games, word processing and business applications, operating systems and network distribution, and compilers, which convert programs to machine language for execution on a computer;
- use different programming languages, including C, C++, and Java (Fortran and COBOL are used less commonly);
- work as part of a team that designs new hardware, software, and systems.

Curriculum Overview

Freshman–Sophomore

The first two years build a strong foundation in object-oriented programming, data structures, and digital systems. During this period, students also develop the necessary foundations in calculus, differential equations, discrete mathematics, and linear algebra. Basic science (physics and chemistry) and electric circuits are included.

Junior

The junior year covers the study of applied probability, computer organization, embedded and real-time operating systems, and microprocessors. Circuits, signals and electronics are also studied during the junior year. These courses provide core concepts necessary for more advanced study of both hardware and software systems.

Senior

The required courses of first three years serve as a preparation for a pair of important courses in the senior year: software engineering and hardware/software integrated systems design. This year is also devoted to the study of elective courses on a variety of topics in hardware and software systems such as Computer architecture, networks, database, and VLSI systems.

Careers for UB CEN Grads

Computer engineering graduates from the CSE Department have joined some of the best companies in the field, including Apple, Amazon.com, Bloomberg, Cisco, General Electric, Google, Hewlett-Packard, IBM, Intel, Kodak, Lockheed Martin, Microsoft, NASA, Nokia, Disney and Xerox.



A new building will house the departments of Computer Science and Engineering and Electrical Engineering.

Did You Know?

- According to the US Bureau of Labor Statistics, employment for Computer Systems and Network Engineers is projected to increase by 30 percent through 2018. Our graduates are aggressively recruited by top companies nationwide.
- Graduates from the CSE Department also go on to pursue higher studies and often receive scholarships for Masters and doctoral studies at prestigious institutions.



Undergraduate CSE students working together.

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CSE students gather at the annual CSE picnic.

World-Class Faculty

CSE faculty members:

- are recognized internationally for their research. Faculty members include fellows of major professional computing societies and editorial board members of prestigious journals.
- have received outstanding teaching awards, including the SUNY Chancellor's Award for Teaching Excellence, the Milton Plesur Award for Teaching Excellence, and the UB Alumni Association's Richard T. Sarkin Award for Excellence in Teaching.
- have collaborative research ties with major computing corporations, including IBM, Microsoft, Google, Intel, Cisco, Nokia, Kodak, and Xerox.

Internship Opportunities

Many of our students gain work experience during their undergraduate studies. Some students find computing-related employment in the summer. Others get experience through internships, which may offer academic credit. Graduates often state that these experiences gave them a competitive advantage during their job-search and facilitated a smoother transition to full-time employment.

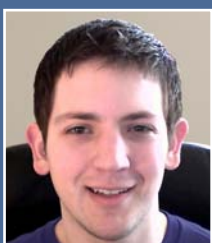
Undergraduate Research

CSE offers undergraduates ample opportunities to engage in creative research. Undergraduates may obtain academic course credit while acquiring valuable research experience under world-class faculty. CSE faculty are at the forefront of their chosen fields of expertise, and students may engage in research on a variety of topics: pattern-recognition, high-performance computing, algorithms and complexity, artificial intelligence, medical image processing, multimedia systems, optical, wireless and sensor networks, computer security and information assurance, software systems and languages, computer architecture and Very Large Scale Integrated (VLSI) systems.



CSE students David H. Fine, left, and David L. Veazie help design a "smart wheelchair" for their physically challenged client.

Successful Alumni



CSE alumnus Brian Anger

Brian Anger completed both a BS (2003) and a MS (2004) in CEN at UB. He is a Software Development Engineer in Test at Microsoft, working on the next version of Windows Media Player. He identifies and investigates issues and develops automation infrastructure in C# and C++ used to test the player. Before joining Microsoft, gained on-the-job experience as an intern at Lockheed Martin and General Dynamics.

Student Clubs and Activities

Many of our undergraduates join the university's Student Chapter of the Association for Computing Machinery (ACM), CSE Undergraduate Student Association, and the IEEE Computer Society student chapter. Both clubs provide opportunities for students to interact with other students, faculty, and community members who share similar interests and career goals. They also sponsor a number of events, including programming contests, guest speakers, and social events.

Accomplished Faculty



Undergraduate Studies Director, Assoc. Professor Ramalingam Sridhar

Director of Undergraduate Studies and Associate Professor Ramalingam Sridhar is Director of the High Performance VLSI Systems and Architecture Laboratory. His active professional career includes eleven patents, membership in many professional societies, and editorial positions on several academic research journals. His teaching is enhanced by his research, which focuses on VLSI circuits and systems, wireless networks and security, embedded technologies, and computer architecture; it has appeared in numerous publications. His corporate and government support includes Microelectronic Design Center (MDC), supported by NYSTAR, the National Science Foundation, and Northrop Grumman-Amherst Systems.



CSE Teaching Associate Professor Bina Ramamurthy

CSE Teaching Associate Professor Bina Ramamurthy's computer systems research currently focuses on distributed systems with emphasis on cloud computing. Her other interests include embedded and real-time systems, grid-computing, semantic web and service-oriented architectures. She has been principal investigator on National Science Foundation funded projects in grid computing (GridForce), embedded systems (Nexos), data-intensive computing (DICE), and an interdisciplinary project with Biological Sciences (Pop! World). She is the Director of a new New York State (SUNY) undergraduate certificate program in Data-Intensive Computing. She has received educational computing support from Amazon.com, Microsoft, and Northrop Grumman. These projects provide excellent opportunities for undergraduates to research in emerging areas in sciences and engineering.

To apply, please visit admissions.buffalo.edu.

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